

PATENT
Atty. Dkt. No. WEAT/0537

IN THE DRAWINGS:

The attached sheet of drawings includes changes to Figure 2. This sheet replaces the original sheet. As requested by the Examiner, the legend "Prior Art" has been added to Figure 2. No new matter has been added.

Attachment: Replacement Sheet

REMARKS

This is intended as a full and complete response to the Office Action dated December 15, 2005, having a shortened statutory period for response set to expire on March 15, 2006. Please reconsider the claims pending in the application for reasons discussed below.

Drawings

The Examiner states that Figure 2 should be designated by a legend such as Prior Art. Applicant has corrected the drawing as requested. Accordingly, Applicant requests withdrawal of the objection and acceptance of the drawings.

Claim Objections

The Examiner states that claims 11, 20 and 24 are objected to as being indefinite. Applicant has amended these claims to clarify the invention being claimed and remove the phrase "isolated from strain," which the Examiner stated was unclear. Accordingly, Applicant requests withdrawal of the objection and allowance of the claims.

Claim Rejections - 35 U.S.C. § 103

Claims 1-3, 8-14 and 17-24 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Cherbettchian et al.* (U.S. Patent No. 5,748,565) in view of *Varnham et al.* (U.S. Patent No. 6,195,162). Applicant respectfully traverses the rejection. Additionally, Applicant has canceled claim 12 without prejudice since the limitation of claim 12 is incorporated into claim 1 as amended.

The Examiner bears the initial burden of establishing a *prima facie* case of obviousness. See MPEP § 2142. To establish a *prima facie* case of obviousness three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary

skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *See* MPEP § 2143. In this case, the references fail to meet at least the third criteria.

Claim 1 recites that an interferometric sensor includes "a section of optical waveguide between said Bragg gratings with the section defining an interferometric path length to enable sensing acoustic pressures impinging on the mandrel, wherein said section of optical waveguide is wound on said mandrel." However, *Cherbettchian* in view of *Varnham* fails to teach, show or suggest a sensing coil wound on a mandrel having two diameters. *Cherbettchian* discloses an interlink for joining hydrophone sensors forming an array. An optical fiber mounted on the interlink taught in *Cherbettchian* does not provide sensing since such sensing occurs at the hydrophone sensors (e.g., reference number 32 in Figure 2 shown connected to one end of the interlink 10 illustrated fully in Figure 1) adjacent to the interlink.

Varnham discloses optical fiber sensing interferometers where an optical fiber with Bragg gratings is wrapped around and bonded to a compliant member without any details about the compliant member. Intervals along the optical fiber between the interferometers disclosed in *Varnham* interlink the interferometers. In other words, the interferometers taught in *Varnham* correspond to the hydrophone sensors in *Cherbettchian* and not the interlink. Any combination of *Cherbettchian* with *Varnham* would fail to effect the interlink disclosed in *Cherbettchian* between the hydrophones such that the interlink with the proposed modification still does not provide sensing.

Therefore, *Cherbettchian* in view of *Varnham* fails to teach, show or suggest each and every element of claim 1. Applicant submits that claim 1 and all claims dependent thereon are allowable. Accordingly, Applicant requests withdrawal of the obviousness rejection and allowance of the claims.

Claim 13 includes the limitation of "an optical waveguide section wrapped around a mandrel with a first portion with a first diameter and a second portion with a second diameter... and signal processing equipment for detecting variations in phase between light pulses reflected from the two Bragg gratings caused by changes in length of the optical waveguide section due to acoustic energy impinging on the mandrel." As

discussed above, *Cherbettchian* in view of *Varnham* fails to teach, show or suggest a sensing coil wound on a mandrel having two diameters. Therefore, *Cherbettchian* in view of *Varnham* fails to teach, show or suggest each and every element of claim 13. Accordingly, Applicant submits that claim 13 and all claims dependent thereon are allowable and requests withdrawal of the rejection and allowance of the claims.

Claim 22 recites a method during the manufacture of an interferometric sensor that includes "controlling the wrapped length of the optical waveguide section by varying the first number and the second number." *Cherbettchian* teaches at column 1, lines 34-36 and column 2, lines 61-65, that "maintaining a fixed and predetermined distance between adjacent sensors" is accomplished by an interlink that has helical grooves for routing of a fiber. The interlink is therefore not related to the manufacture of an interferometric sensor. Further, *Cherbettchian* discloses that the fiber is routed in the groove without any indication of varying a number of wraps around different portions of the interlink to control a wrapped length since the length of the fiber on the interlink is based on the grooves.

Therefore, *Cherbettchian* in view of *Varnham* fails to teach, show or suggest each and every element of claim 22. Applicant submits that claim 22 and all claims dependent thereon are allowable. Accordingly, Applicant requests withdrawal of the obviousness rejection and allowance of the claims.

Allowable Subject Matter

Claims 4-7, 15 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. In response, Applicant submits that these claims are allowable based at least on the traversal presented herein regarding the independent claims from which these claims depend. Accordingly, Applicant respectfully requests withdrawal of the objection and allowance of the claims.

PATENT
Atty. Dkt. No. WEAT/0837

Conclusion

The references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed. Having addressed all issues set out in the office action, Applicant respectfully submits that the claims are in condition for allowance and respectfully requests that the claims be allowed.

Respectfully submitted,



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